



Amy G. Rabinowitz  
*Assistant General Counsel*

June 23, 2005

Mary L. Cottrell, Secretary  
Department of Telecommunications and Energy  
One South Station  
Boston, MA 02110

**Re: D.T.E. 04-116**

Dear Secretary Cottrell:

On behalf of Massachusetts Electric Company and Nantucket Electric Company, I am enclosing our responses to the Department's third set of information requests.

Thank you very much for your time and attention to this matter.

Very truly yours,

Amy G. Rabinowitz

DTE-LDC 3-1

Request:

Refer to Order Instituting Safety Standards, New York Public Service Commission Case 04-M-0159 (January 5, 2005). Please comment on the feasibility of implementing a stray voltage performance measure similar to that described in Attachment A of the above order, with an annual inspection performance target of 95 percent of those facilities scheduled to be inspected during a particular year. The performance measure would have a penalty feature similar to that applied to odor call response for gas distribution companies, such that for each percentage point that an electric distribution company's performance falls below a benchmark of 95 percent, the electric distribution company would be assessed a penalty equal to 25 percent of the total penalty allocated to the stray voltage standard. The maximum penalty for this SQ measure will be incurred at a performance level of 91 percent.

Response:

Mass. Electric strongly recommends that the Department not adopt the voltage testing and inspection programs adopted in New York. Before explaining the reasons, however, we believe it is important to make clear what the New York order requires.

In the Order Instituting Safety Standards, NY PSC Case 04-M-0159, the PSC adopted two related, but separate, programs. One program required testing equipment for elevated voltage. The PSC referred to this program in the order as stray voltage testing. The other separate program required the visual inspection of all utility facilities for safety and reliability problems. For purposes of this response, we refer to each, respectively, as the "Stray Voltage Testing Program" and the "Inspection Program." Each program is summarized below.

New York Stray Voltage Testing Program

Under the Stray Voltage Testing Program, the PSC required annual testing of every single "publicly accessible" electric facility capable of conducting electricity, without regard to the geographical location of the facility or the probability that a person could come into contact with the facility; plus testing of metallic street light standards and traffic signals owned by non-electric corporation municipalities. While the order used the term "publicly accessible", the PSC later defined such accessibility in the broadest terms, including remotely located facilities in rural areas far away from any expected pedestrian traffic. In conjunction with the Stray Voltage Testing Program, the PSC established a highly punitive financial penalty if utilities did not achieve 100% compliance every year. The New York utilities have challenged the legality of the financial penalty provision.

### New York Inspection Program

Under the Inspection Program, the PSC required the visual examination of every facility, including towers, poles, guy wires, risers, overhead cables and conductors, transformers, breakers, switches and other above ground equipment and facilities. In addition, visual examination is required of the interior of manholes, service boxes, vaults, and other underground structures; and internal inspections of street light standards. Unlike the Stray Voltage Testing Program, the Inspection Program is spread over five years. That is, inspections are required for 20% of facilities each year, such that 100% of the facilities would be inspected by the end of five years. A separate set of performance standards, with associated penalties was established for these inspections (to be distinguished from the stray voltage testing targets).

For the reasons described below, Mass. Electric believes that neither the Stray Voltage Testing Program nor the Inspection Program is appropriate for Massachusetts:

### Problems with the New York Stray Voltage Testing Program

First, the Stray Voltage Testing Program is overly broad and results in substantial costs without commensurate public benefit. While it is reasonable to test those facilities that are most likely to have the potential of exposure to elevated voltage (e.g., due to damage caused by road-salt, vehicle collision, snow plows, or other similar effects), the New York program makes no distinction between testing of street lights in heavily trafficked urban areas and testing of guy wires in remote rural areas where pedestrian traffic is non-existent. Thus, substantial time and resources will be spent testing equipment that has little likelihood of elevated voltage and almost no likelihood that any person would ever come into contact with the facility. Expenditure of resources on such programs may adversely affect the availability of resources for use in programs (e.g., preventive maintenance, system upgrades, etc.) that will actually improve safety and reliability of the system.

Further, different testing protocols are appropriate for different areas of the state. The New York order does not distinguish between suburban/rural and urban areas and gives the utilities no latitude in creating testing protocols most appropriate for the specifics of their service territory. What is appropriate on heavily populated city streets may not be in a suburban/rural environment where access to energized utility facilities is theoretically possible but very unlikely. For example, in New York, the PSC's order was precipitated by an incident occurring in New York City. In response, the PSC required standards established for dense urban networks to be used by all utilities equally, without fairly taking into account the difference between the service territories of the upstate utilities who cover a geographic size eighty-two times (approximately 65,000 sq miles versus approximately 800 sq miles) that of New York City. In addition, the upstate systems are predominantly overhead, whereas the elevated equipment voltage problems

## Responses to the Department's Third Set of Information Requests

have mostly been associated with underground systems. These fundamental distinctions between urban underground and suburban/rural overhead systems, and the impact of population density and increased pedestrian traffic present in urban areas, were not factored into the New York standards. Rather, the New York order simply assumes that all facilities pose an equal risk, e.g., that faced by a pedestrian in a dense urban networked system, regardless of the nature or location of the facility. The New York order does suggest, however, that upon developing further information regarding the scope and timing of testing, the standards may be further revised (e.g., to reflect more accurately the relative risk to a pedestrian associated with urban versus suburban/rural systems). Like New York, Massachusetts, too, has both urban and suburban/rural areas, and the Massachusetts utilities serve those areas differently. Attachment 1 is a map of Massachusetts showing population density.

Second, the requirement that all publicly accessible facilities be tested annually is unrealistic and not reasonably tailored to address the risks that may be of concern. The scope and timing of testing and inspection programs should be based on data and calculated probabilities. The New York program requires annual testing of everything, without considering the nature, scope, and extent of elevated voltage problems within the widely varying service territories. A more pragmatic approach in New York would have been to establish an initial testing program to gather data regarding facilities located in areas most likely to have pedestrian traffic. Once that information had been gathered and evaluated, then consideration could have been given as to the necessity of establishing regular patterns of testing. The New York program presupposes the existence of a problem everywhere and establishes an annual testing program for everything every year, at substantial cost, without hard data to support such a broad scope.

Third, the Stray Voltage testing requirements fail to recognize the benefits of the inspection requirement and vice versa. For example, potential stray voltage problems on overhead downgrounds are generally a result of physical damage (e.g., being cut) or lack of bonding, both of which could be found in a visual inspection. Similarly, voltage testing of a street light or nearby metallic handhole would indicate whether any wires are in contact with the exposed metal surface, whereas opening the equipment for a visual inspection (and often damaging the seals in the process) yields no greater result.

#### Problems with the New York Inspection Program

The Inspection Program implemented by the New York PSC, likewise, is overly broad and unnecessary. By imposing absolute inspection requirements via regulation, the PSC was effectively eliminating the application of judgment on how to provide safe and reliable service, without any evidence that such an expensive and prescriptive program would bring any material benefits to increase safety and reliability. There is no need to establish such a requirement in Massachusetts. Managing safety and reliability should be

and is the province of the utilities, with performance measured from the results, not the counting of the number of tests or number of inspections performed.

Problems with Establishment of an SQ Measure for Testing or Inspections

With respect to establishment of a performance standard for testing or inspections, Mass. Electric does not believe that it is appropriate or necessary to establish penalties associated with testing or inspections. As the Department noted in D.T.E. 99-84, SQ measures "focus on key areas of a utility's performance as valid indicators of overall SQ." D.T.E. 99-84 at 43. In other words, SQ measures appropriately address the outputs that a utility provides its customers, in the form of safe and reliable distribution service and responsive customer service. The steps that a utility takes to achieve these goals are properly left to the management of the utility. The testing and inspection programs that the New York PSC ordered do not measure the utility's performance. Instead, they set out prescriptive programs that utilities must implement, without consideration for the relative risk posed by different equipment types or geography. By doing so, the New York PSC has substituted its own judgment for that of the utilities as to how to maintain a safe distribution system. As described above, the New York PSC requirements are not considered a cost effective solution to any perceived elevated equipment voltage or other safety issues. By continuing to use SQ measures to address results, the Department can focus the Massachusetts distribution companies on achievement in a manner best suited for their unique service territory.

The Company's Program to Test for Elevated Equipment Voltage

The Company takes its responsibility for the safe and reliable operation of the distribution system very seriously. This includes its ongoing work to reduce the risks of elevated equipment voltage.

Of course, the Company immediately responds to any report of elevated equipment voltage to test the actual voltage level and make the area safe. In 2004, following a sample voltage test survey of a broad range of publicly accessible equipment in February, the Company tested all of its metal streetlight standards and found 0.7% with a reading in excess of 8 volts. Each of these cases was immediately made safe and repaired. Over the next year, the Company plans to conduct additional voltage testing of all metal streetlight standards.

The Company is currently commencing an inspection and assessment of the entire overhead distribution system (including approximately one million distribution poles) over the next three years. This will include a test for elevated voltage on publicly accessible equipment; e.g., riser conduits, guy wires and down grounds.

The Company is developing new overhead and underground working inspection procedures that will include an elevated equipment voltage test on any publicly accessible

equipment that is otherwise being worked on by Company personnel. The Company is also developing a padmounted equipment inspection program to be conducted on a five-year cycle.

Mass. Electric notes that the Department has hired Navigant Consulting to review the significant efforts that Mass. Electric and the other Massachusetts utilities are taking to minimize elevated equipment voltage and develop recommendations for further action. Mass. Electric believes that this effort, outside of a review of service quality guidelines, is appropriate and should help both the Department and the utilities to address the issue.

### Guiding Principles

In New York, Niagara Mohawk Power Corporation joined several other New York utilities<sup>1</sup> in recommending eight guiding principals for dealing with elevated equipment voltage.

- 1.) **Safety** – Providing safe and reliable electric service is paramount. Any additional testing and inspection standards mandated should contribute to safety.
- 2.) **Equipment and Service Territory** - The testing and inspection requirements should reflect adequate consideration of the differences in utility systems (e.g., transmission vs. distribution), utility equipment (e.g., overhead vs. underground networks) and population densities (e.g., urban, suburban and rural).
- 3.) **Focus of Efforts** –Testing and inspection efforts should be focused on facilities identified as having the greatest potential exposure to the public. The assessment of such facilities and the scope of required inspection should be developed considering factors such as the type of facility, location, and access or lack of access by the public. The scope of testing and inspection efforts should recognize that electric utility infrastructure is designed to be inherently safe with protection schemes that protect the public and the system itself.
- 4.) **NESC Test and Inspection Intervals** – The NESC requires that electric equipment be tested, inspected and maintained at such intervals as experience has shown to be necessary. Equipment inspection and elevated voltage testing should be consistent with this requirement.
- 5.) **Penalties do not Contribute to Safety** - The provision of safe and reliable electric service is the primary responsibility of the utilities. Adding penalties, in the form of rate adjustments, for failure to meet test and inspection targets is unnecessary, may be

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<sup>1</sup> Mass. Electric understands that the Guiding Principles were accepted by New York State Electric & Gas, Rochester Gas & Electric, Central Hudson Gas & Electric, and Niagara Mohawk Power Corporation. Keyspan also contributed to the development of the Guiding Principles.

Massachusetts Electric Company  
Nantucket Electric Company  
Docket DTE 04-116  
Responses to the Department's Third Set of Information Requests

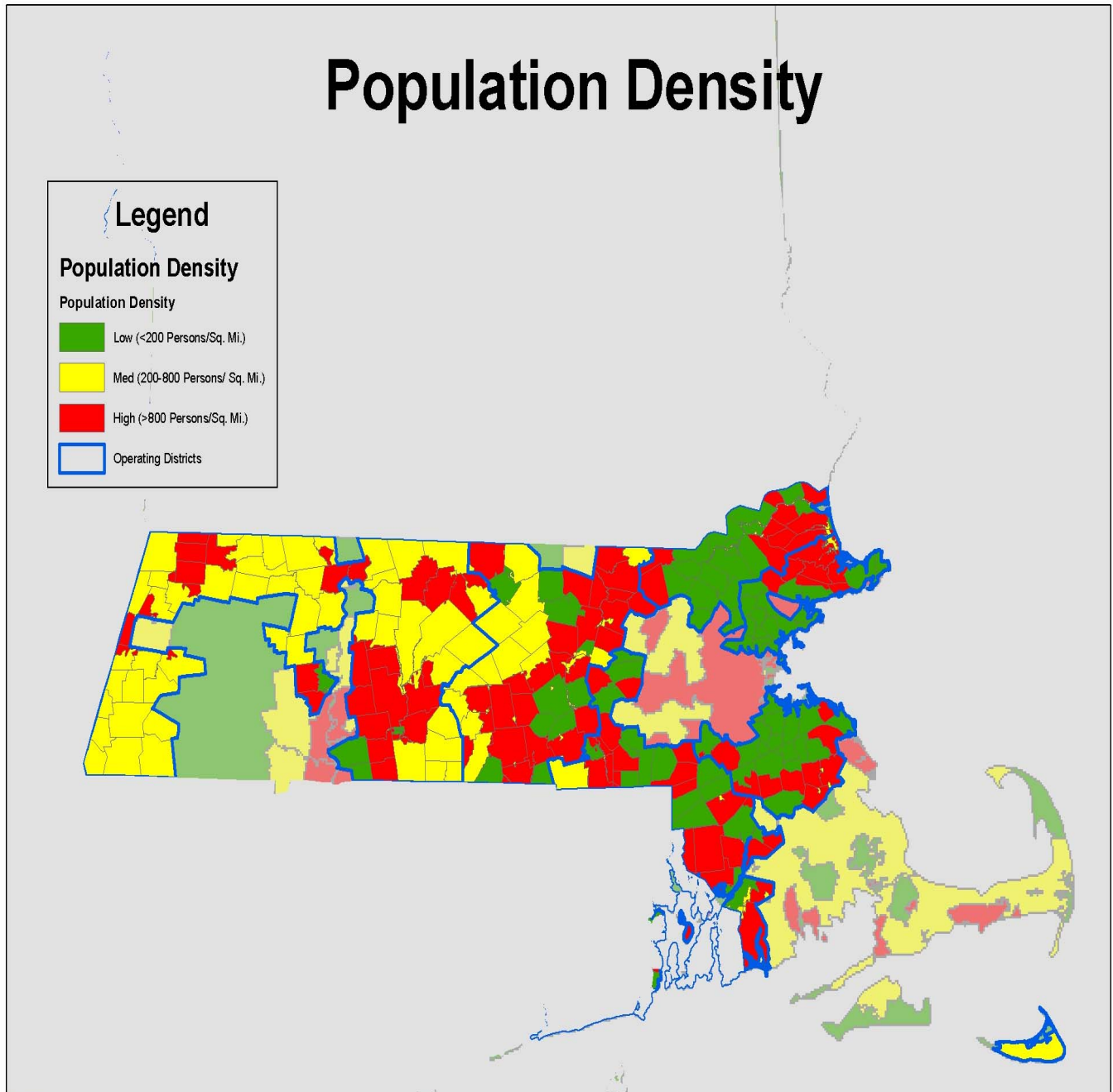
duplicative of existing reliability standards, and will contribute to higher costs to ratepayers without improving safety.

- 6.) **Cost Commensurate with Benefits** - Any proposed new standards and record keeping requirements should consider the cost effectiveness of such standards and requirements to ensure that the costs imposed on the public are commensurate with the added safety or reliability resulting from their implementation.
- 7.) **Recovery of Costs** – Any incremental testing and inspection costs resulting from this proceeding shall be recovered or deferred for subsequent recovery in the utility's rate plan.
- 8.) **Demarcation of Ownership** - Responsibility for customer-owned and other non-utility equipment should rest with the owner of such equipment. The utility's responsibility for testing and inspecting electric facilities extends only up to the delivery point of demarcation.

To the extent the Department is considering the implementation of testing or inspection requirements in Massachusetts, these principles would be applicable here as well.

Prepared by or under the supervision of: Scott Leuthauser

Attachment 1





DTE-LDC 3-2

Request:

Please refer to Order Instituting Safety Standards, New York Public Service Commission Case 04-M-0159 (January 5, 2005). Assuming the Department were to adopt a stray voltage service quality measure similar to that proposed in Information Request DTE-LDC 3-1, provide a weighting factor that would be considered appropriate to ascribe to such a performance measure.

Response:

Mass. Electric believes that no weighting (i.e., 0%) should be given to an inspection or stray voltage testing service quality measure. For the reasons provided in the response to Request DTE-LDC 3-1, there is no evidence to suggest that such programs are warranted or should be adopted in Massachusetts. Notwithstanding the foregoing, if the Department were to require such a performance measure, the Department should allow the utilities to recover the incremental costs incurred to implement a program in order to meet the requirements of the performance measure.

DTE-LDC 3-3

Request:

Please comment on the advantages and disadvantages of calculating SAIDI and SAIFI statistics and penalties based on the performance of individual feeder circuits rather than system averages.

Response:

SAIDI and SAIFI are "system" indices. The system being evaluated can be of any size, including an individual feeder, but, the indices of individual systems cannot be averaged to derive a meaningful value. Both SAIDI and SAIFI are based on the number of customers served. If one were to average the individual feeder indices, the result would be heavily weighted towards those feeders with very small numbers of customers served. In general, this type of feeder is of short length and has better than average reliability. The greater the number of feeders with small numbers of customers served on a system, the more the system reliability index would appear to be improving. This distortion of the measure of reliability that the customers would actually be experiencing is not recommended by the Company.

When SAIDI and SAIFI are applied to very small systems, such as single feeders, extremely large variability can occur in the resultant indices from year-to-year. Incidents causing reliability problems on a system are random events, but, they do not occur on an evenly distributed spatial or temporal basis. Any single feeder may, over a reasonable period of time, experience a level of reliability equal to that of the system as a whole, but, during any one specific year have no interruptions at all, or, experience ten times the average for the system.

This variability is not necessarily related to the level of maintenance or investment on that individual feeder. External factors have a significant influence over the variability of the frequency of interruptions in a limited area, such as that served by a single feeder. If SAIDI and SAIFI of individual feeders were utilized for penalties and incentives, not only would the variability of individual feeder indices render the benchmark values moot, the total penalty/incentive value would have to be divided between over 1100 feeders on the Company's system. The Company does not recommend calculating SAIDI and SAIFI on a feeder basis.

DTE-LDC 3-4

Request:

Please comment on the advantages and disadvantages of making CAIDI and CAIFI penalty measures.

Response:

CAIDI, a measure of the average duration of the average interruption, can be calculated by dividing SAIDI by SAIFI. While any one of these three indices can be determined from the other two, the Company supports the use of SAIDI and SAIFI for service quality measures.

CAIDI might be an indicator of how expeditiously a utility addresses customer interruptions, but, a few, very short duration events that affect a large number of customers can greatly distort the final resultant index. For example, a system with a current CAIDI of 60 minutes, derived from 54,000,000 customer minutes of interruption and 900,000 customers interrupted, could see its CAIDI drop to 59.62 minutes with a single substation, serving 6000 customers, being interrupted for 3 minutes. Obviously, both SAIDI and SAIFI would increase, SAIFI by approximately the same percentage difference seen in the CAIDI drop, but SAIDI would increase by a much smaller fraction of that percentage.

CAIDI is the only index where allowing an event to occur, thereby lowering the service quality to the customers, can improve the value of the index. It is for this reason that the Company does not recommend the use of CAIDI as a service quality index with attached penalties and incentives.

CAIFI, the customer average interruption frequency index, is the average number of times the customers who actually experienced at least one interruption were interrupted. This index, when compared to the SAIFI value, provides an indication of the distribution of customer interruptions, or if areas of high numbers of interruptions exists within a company's service territory. For example, if the SAIFI for a system was 1.0 and the CAIFI was also 1.0, every customer would have experienced 1 interruption. If the CAIFI was 2.0, however, one half of the customers would not have experienced an interruption while each of the other half experienced 2. If in this same example the CAIFI was 10.0, 90% of the customers would have perfect reliability while the other 10% would have suffered through 10 interruptions that year.

This example is simplistic, with SAIFI being exactly 1.0, but, the general idea of the value of the CAIFI index can be seen. The problem with utilizing CAIFI is that detailed interruption data must be kept on each specific individual customer basis. The Company's outage management system (OMS), as those of most utilities, was developed

to allow the expeditious identification of trouble locations and capture of pertinent information about the restoration process on a physical configuration of the feeder basis. Customer data is limited to the number attached to any single branch of the feeder at the time of the interruption.

Since the physical configuration of the feeder can, and does change on a not infrequent basis, any matching of customers to specific interruptions has been done post event, with input from field personnel as to what feeder changes had occurred. This has been an adequate process for the small number of customers that have required this level of interruption tracking, but, it would be physically and economically prohibitive to accomplish on a system-wide basis.

Automation of this process, while possible, would require significant modification to the OMS and Customer Information System interface. Since similar information, as to whether or not pockets of less than desirable reliability exists, can be discerned from the individual feeder results, and to a much greater locational detail, the Company believes that CAIFI is much too costly and superfluous to be utilized as a service quality index with attached penalties and incentives.